

APPENDIX I

CUMMINS' QUICKCHECK Users Manual

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WELCOME

We thank you for purchasing Cummins' QUICKCHECK datalink reader. It is our hope that this device, coupled with your Palm Computing™ handheld organizer, will add value to your already valuable Cummins purchase by giving you the ability to read engine information quickly and conveniently¹. The added capability to read and store total trip data allows you to further analyze a given vehicle's performance to make information tracking of that vehicle as effective as possible.

QUICKCHECK was not designed to supersede Cummins' INSITE™ service tool. It has limited functionality compared to the full service tool, but has the advantages of exceptional portability and lower cost.

QUICKCHECK functions with a wide range of Palm Computing devices—PalmPilot Professional Edition™, Palm III™ series, and Palm VII™. With an optional adapter, it also functions with Palm V™. QUICKCHECK is **NOT** compatible with Handspring™ Computing devices. For convenience, this manual refers to all Palm Computing devices as *handheld organizers*, *handheld devices*, or simply *handhelds* or *organizers* without including the Palm name or specific version.

To operate the QUICKCHECK datalink reader, your handheld organizer requires version 3.x of the Palm Computing HotSync® synchronization technology software. If your software is version 2.0, update it to the latest version without cost at the Palm website: <http://www.palm.com>

These are the minimum requirements for your computer system to synchronize with a Palm device as listed in the Palm Computing *Handbook*:

- Windows 95, Windows 98 or Windows NT 4.0
- IBM-compatible 486 computer or higher
- 8 MB RAM minimum; 16 MB recommended for Windows NT 4.0
- 20 MB available hard disk space
- VGA monitor or better (256 color video display)
- CD-ROM drive (you can also download the Palm Desktop software from <http://www.palm.com> or order 3.5 diskettes from 3Com Corp.)
- Mouse
- One available serial port with the organizer cradle plugged in

CAUTION: Connect and operate QUICKCHECK only when the vehicle is stationary. The key switch must be in the *on* position during operation of QUICKCHECK.

¹ QUICKCHECK is designed to work with any vehicle or engine that supports the standard SAE J1587 datalink. For simplicity, this document only refers to the *engine* when discussing QUICKCHECK features and capabilities. Please note that not all QUICKCHECK functionality is available when reading data from non-Cummins engines.

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INSTALLATION

The QUICKCHECK installation is a typical Windows, self-executing installation. It sets up the application for the handheld organizer and is also used to install the QUICKCHECK Conduit, which is used by the HotSync Manager to send stored engine data from the handheld organizer to the host PC.

The QUICKCHECK software installation is as listed below. The following steps assume that you have already installed the handheld Desktop software. If you have not installed this software, see handheld handbook for instructions on installing the Desktop software.

1. Insert the QUICKCHECK floppy disk² into your computer.
2. Click on the Windows 95/98/NT Start menu and click *Run*.
3. Type *a:quickchk.exe*, where *a:* is the letter assigned to the drive containing the floppy disk.
4. Click the *OK* button to install the QUICKCHECK desktop component (the Conduit) along with registering the Palm Application with the Palm HotSync Manager.
5. Follow the onscreen instructions to complete the installation. Installation places all PC components into the root directory of the handheld organizer (typically *C:\palm*). However, QUICKCHECK components are placed in the *\quickchk* directory immediately below the Palm root directory.
6. Perform a HotSync operation to install the QUICKCHECK application on the handheld organizer.

Note: The HotSync Manager must be stopped and restarted to recognize the newly installed conduit. Please refer to the Palm Computing documentation that came with your handheld organizer for complete instructions on how to do this. If the default setting of HotSync manager "Always available" has not been changed, then stopping and restarting your PC will restart the HotSync Manager.

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APPLICATION

The QUICKCHECK application, in conjunction with the QUICKCHECK datalink adapter, allows you to read and capture select SAE J1587 engine data. This data includes equipment identification, fault information, current operating parameters, and total trip information.

With QUICKCHECK, you can:

- Read and store equipment identification
- Read and store both active and inactive engine faults
- Monitor engine operating parameters, such as engine rpm, coolant temperature, oil pressure
- Read and store vehicle total trip information, such as total fuel consumed, total engine hours, total idle hours

Adapter Installation

The QUICKCHECK application uses the QUICKCHECK datalink adapter to connect it to the vehicle's J1587 public datalink. It is similar in structure to the modem for the handheld organizer, but is designed to perform as a datalink adapter, similar to the Cummins INLINE™ datalink adapter, and hence will not double as a modem.

A special cable is shipped with the QUICKCHECK datalink adapter. The *adapter* end of the cable has a standard 4-pin modular phone-style plug. The other end connects to the J1587 datalink connector/adapter on the engine or in the vehicle and is available in two configurations: a 6-pin or a 9-pin Deutsch connector. Slip the QUICKCHECK datalink adapter onto the bottom of the handheld organizer, slide the 4-pin plug into the adapter and connect the Deutsch connector end of the cable to the J1587 datalink connector.

CAUTION: Never connect a telephone line to the QUICKCHECK datalink adapter. This may damage your QuickCheck adapter.

Activating QUICKCHECK

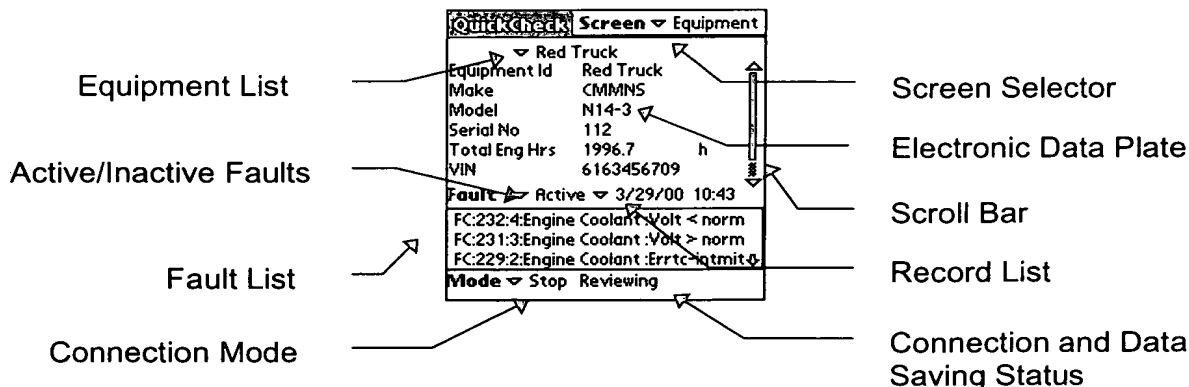
Once installation is complete, the QUICKCHECK application icon depicted at the right appears in the handheld organizer's application launcher. Tap the icon to launch the QUICKCHECK application.



Equipment Screen

Once the QUICKCHECK icon is tapped, the Equipment screen appears. This screen, along with the Monitor and Trip screens described later, is considered to be a main screen. Each main screen contains some of the same information (such as faults or connection status) and controls. This allows certain information and functionality to be available in multiple places in the application. This section serves to document the repeated information for all screens. A fourth screen, the Fault screen (also a main screen), is discussed later.

The Equipment screen contains several screen objects—each pointed out in the picture below and described in the paragraphs that follow.



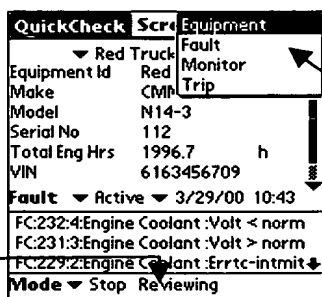
Equipment List

This pop-up box is available only in the *Stop* mode. It lists equipment QUICKCHECK has already identified by prior connection. The application uses the information contained in the list box in future downloads (in *Auto* or *Save* mode) if it determines it has been connected to this engine before. If the handheld is not currently hooked up to an engine, this pop-up can be used with the past download Record List pop-up to look at previously stored engine information (Equipment, Fault and Trip).

Parameter Value Validity Strings

Three of the four screens (Equipment, Monitor and Trip) convey data validity information for a given value. This easily lets you know whether a given value has been received or is up to date. In *Live* or *Auto* mode, if the screen is displaying what appears to be *normal* information for a given parameter, it is the most recently received information. If the information becomes out of date, the values are displayed in **reverse-video**. In addition, the fields can contain strings that convey the validity status of a given parameter. For example, *Disconnected* or *Unavailable* is displayed if the data is not accessible.

Screen Selector



The Screen Selector is used to choose the four screens mentioned earlier:

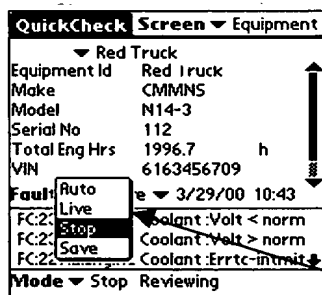
- Equipment (default screen on startup)
- Fault
- Monitor
- Trip

Tap the Screen Selector arrow to bring up the pop-up that contains the four choices. Tap the desired choice to go directly to the screen you want or by tapping the organizer Menu icon button.

Connection and Data Saving Status

This message contains information about either the connection status or the data-saving status. Messages such as *Communicating*, *Datalink Down* and *Saving Data* are some of the phrases displayed in this area of the screen. When using QUICKCHECK, glance at this portion of the screen for an idea of the current overall status of the application.

Connection Mode



The Connection Mode controls QUICKCHECK's mode of operation. Selecting *Auto* allows QUICKCHECK to query all savable data (equipment, fault, and trip) and store it, based on its determination of which piece of equipment it is connected to. If the application recognizes the current equipment, it attempts to save the data without the user having to manually intervene. The *Live* option allows the application to connect with the engine and monitor information, but

does not automatically store retrieved data. The *Save* option stores the current data set. *Stop* is used to disconnect the device from the datalink and review previous downloads, using the Equipment List and Record List pulldowns.

Active/Inactive Faults

QUICKCHECK Screen ▾ Equipment	
▾ Red Truck	
Equipment Id	Red Truck
Make	CMMNS
Model	N14-3
Serial No	112
Total Eng Hrs	1996.7 h
VIN	6163456709
Fault	As/29/00 10:43
FC:2	Inactive
FC:231:3:Engine Coolant :Volt < norm	
FC:229:2:Engine Coolant :Errtc-intmit	
Mode ▾	Stop Reviewing

This control allows you to select which faults—active or inactive—are displayed and/or saved. *Active* faults are those currently present on the engine control module (ECM) or other diagnostic device. *Inactive* faults allow you to see old fault occurrences stored on the ECM.

Note: QUICKCHECK cannot reset faults in the ECM. This can only be done with the Cummins INSITE service tool.

Faults List

This area lists all faults (active or inactive) being broadcast on the datalink. Tapping on a fault in the list takes you directly to the Fault main screen where more information is displayed about the selected fault.

Record List

If QUICKCHECK contains previous downloaded information, in the *Stop* mode, the pop-up list lets you see past data and the download dates. It is sorted with the most recent date at the top. This is used for looking at previously downloaded information and job images. If the list is used in conjunction with the Equipment List, you can look at all³ previously stored data downloads.

Electronic Data Plate

The Equipment Screen contains the application data used to identify a given piece of equipment such as ID, user serial number, etc. Most of the information concerns engine identification. The total engine hours parameter is also shown on this screen.

As is true with the other screens, you can scroll the data with the scroll bar located on the right side of the handheld organizer's screen. Activate it by using either the stylus or the scroll keys.

³ All data (Fault and Trip), which was listed before the last HotSync, is removed from the handheld organizer after a successful HotSync process occurs.

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Monitor Screen

QuickCheck Screen ▾ Monitor		
Engine Speed	3583.7	RPM
Eng Cool Temp	155	F
Boost Pressure	19.375	PSI
IMT	75	F
Eng Oil Pressure	72.5	PSI
Fuel Rate	570.63	gph
Fault ▾ Active		
FC:228:1:Engine Coolant :Below Normal		
FC:229:2:Engine Coolant :Errtc-intmit		
FC:231:3:Engine Coolant :Volt > norm		
Mode ▾ Live Communicating		

The Monitor screen has a parameter list box similar to the equipment data list box on the Equipment screen. The Monitor screen displays engine operating parameters monitored by the ECM in real time, such as current engine rpm, coolant temperature and oil pressure.

You can scroll the data with the scroll bar located on the right side of the handheld organizer's screen. Activate it by using either the stylus or the scroll keys.

Trip Screen

QuickCheck Screen ▾ Trip		
Max Road Spd	65	mph
Cruise Set Spd	65	mph
Total Idle Hrs	3276.7	h
Total Idle Fuel	6.8	gal
Total Veh Dist	1019791.5	mi
Total Eng Hrs	1996.7	h
Fault ▾ Active		
FC:228:1:Engine Coolant :Below Normal		
FC:229:2:Engine Coolant :Errtc-intmit		
FC:231:3:Engine Coolant :Volt > norm		
Mode ▾ Live Communicating		

The Trip screen has a data list box similar to the equipment data list box on the Equipment screen. On the screen is aggregate trip information such as total fuel consumption, total vehicle miles and total engine hours.

You can scroll the data with the scroll bar located on the right side of the handheld organizer's screen. Activate it by using either the stylus or the scroll keys.

Fault Screen

QuickCheck Screen ▾ Fault	
▾ Active ▾ 3/29/00 10:43	
FC:232:4:Engine Coolant :Volt < norm	
FC:231:3:Engine Coolant :Volt > norm	
FC:229:2:Engine Coolant :Errtc-intmit	
FC:228:1:Engine Coolant :Below Normal	
Description:	
Engine Coolant Pressure	
Sensor Voltage Below Normal, or	
Shorted Low	
PID: 109	Count: 1

The Fault screen has a more complete description of any fault read by the ECM than the information displayed on the Equipment, Monitor and Trip screens. The Fault screen displays the Cummins Fault codes, followed by the Failure Mode Identifier (FMI) number. For non-Cummins Engines, only the Parameter Identifier (PID) or Subsystem Identifier (SID), followed by the FMI number and the PID or SID description is displayed. Fault occurrence count and the PID or SID is displayed on the bottom of the

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Adapter Status Screen

The Adapter Status screen displays information about the QUICKCHECK datalink adapter, for example the adapter firmware version, adapter battery level and datalink status. This screen is in the options pulldown list that is accessible via the menu button located on the handheld organizer.

Limitations

These limitations apply to QUICKCHECK.

1. QUICKCHECK does NOT write information to the ECM. Therefore, it cannot reset trip or fault data, nor can it modify customer trims. The Cummins INSITE service tool must be used to write to the ECM.
2. QUICKCHECK currently reads only SAE J1587 protocol and cannot read SAE J1939 protocol.

BASIC TUTORIAL

This section describes a typical data-gathering session. It begins with collecting (scanning) the data, reviewing previously collected data, then downloading the saved data to the PC using the HotSync process and finally how to remove QUICKCHECK stored data from the handheld. This tutorial assumes the handheld organizer will be connected to a vehicle that it has not been previously connected to and the user is familiar with Palm Computing handheld organizer standard operations. It also assumes batteries are installed in the QUICKCHECK datalink adapter. The QUICKCHECK datalink adapter does not come with the batteries installed. The **Battery Installation** section of the document describes how to install the batteries in your adapter.

Attach the QUICKCHECK datalink adapter to the bottom of the handheld organizer. Select the appropriate datalink cable whose datalink connector mates with the public datalink connector of the equipment's wire harness. Evenly engage the 4-pin plug of the datalink cable into the datalink adapter and the 6 or 9 pin connector into the vehicle's J1587 public datalink connector on the equipment harness or on dash connector. (See equipment Owner's Manual for identification and location of the public datalink connector.) Engine should be keyed "On". Tap the QuickCheck application icon. If the Connection **Mode** (lower left corner of the screen) indicates either *Live* or *Auto*, the QUICKCHECK application immediately attempts to connect to the ECM. If the Connection **Mode** is not set to either, select *Live* now.

Next verify that you are in the Equipment screen. If QUICKCHECK was entered from the handheld organizer's application launcher, Equipment is the default screen. If the current screen is other than Equipment (i.e. Fault, Monitor or Trip), select *Equipment* from the **Screen** pulldown list at the top right.

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When QUICKCHECK first connects to a vehicle, it tries to locate the engine's **Make**, **Model** and **Serial No** (serial number). If the vehicle is communicating⁴ with QUICKCHECK, the fields on the Equipment screen are filled in as information is scanned, but the **Equip Id** field is blank. This field is filled in by the user, the first time a vehicle is scanned. Touch to the right of the **Equip Id** label to enter the data entry mode. Using standard Palm Computing text methods (graffiti, keyboard, etc.), enter a name or label that is user friendly and easy to remember. The next time someone connects to this vehicle with this handheld, the QUICKCHECK application will search its past records and fill in the **Equip Id** field with the name you entered.

You should still be looking at the Equipment screen where the engine **Make**, **Model** and **Serial No** are listed, along with **Eng. Hrs** (engine hours), **VIN** (vehicle identification number), and **Soft ID** (software ID). Not all fields are visible at the same time but can be seen by scrolling the list. If a field is displayed as *Initial*, *Unavailable* or *Disconnected*, QUICKCHECK is indicating this particular piece of information has not been received on the datalink or QUICKCHECK may not be connected correctly. Check your connections to be sure that is not the problem.

If faults⁵ are present, you will see them listed in the Faults List box located in the lower portion of the screen. Selecting any fault takes you immediately to the Fault screen, which displays more details about the selected fault.

Next choose *Monitor* from the **Screen** selector at the top. This screen shows current engine operating information (sensor information such as engine speed, coolant temperature, oil pressure) in real time as the ECM broadcasts it. Any parameters not scanned by QUICKCHECK are displayed as *Initial* or *Unavailable*. Like the Equipment screen, faults are displayed in the fault list box.

Choose *Trip Screen* selector at the top to display engine and vehicle trip information (total hours, total miles, fuel used, etc.).

You can switch between the Equipment, Fault, Monitor and Trip screens at any time. Note that the Equipment and Trip screens contain nonchanging information while the Fault and Monitor screens are continually updated.

At this time, select the **Save** setting of the Connection **Mod** control located at the bottom left of the Equipment, Monitor or Trip screen. This initiates the data-saving mechanism of QUICKCHECK. The application saves the current values for the equipment, fault and trip information. This information is time stamped and can be viewed later, even when QUICKCHECK is not connected to the engine.

You can view previously stored data on the handheld by selecting the **Stop** setting of the Connection **Mode** screen control. When **Stop** is selected, two pulldowns are available: one above the Equipment ID at the top of the screen to display a list of previously scanned vehicles, and another to the right of the Faults list with

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a list of dates and times if any. Once a piece of equipment is selected, the other pulldown will contain entries that are in date/time format. This allows you to select which download is currently viewable.

Previously stored data can be deleted from the handheld by selecting the *Stop* setting of the Connection **Mode** screen control, then choosing the equipment and record from the pulldown lists that you want to delete. Tap the menu button located on the handheld organizer. Select **Del** then select either the equipment or record to delete. Deleting the equipment will remove the equipment from the equipment pulldown list. Deleting the record will only remove the currently viewed date/time record from the record pulldown list.

Note: Perform a HotSync operation before deleting any equipment data from the QuickCheck application.

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CONDUIT

The Palm Computing HotSync Manager oversees the process of synchronizing data. The handheld organizer uses a conduit to transfer data to and from the user's PC. However, with QUICKCHECK, data can only be transferred one way—from the handheld organizer to the PC. This allows the PC to unload data from the handheld and free up memory.

Installation

The installation of the QUICKCHECK Conduit is described in the Installation section on page 6.

Customization

Conduit customization is achieved by accessing the HotSync Manager⁶ by right clicking the icon located in the bottom right portion of the PC screen and choosing *Custom*. Currently, the only options are to allow the conduit to transfer data from the handheld organizer to the PC or to disable the conduit altogether. To transfer data, select either the *Synchronize the files*⁷ or the *Handheld overwrites Desktop* option. To disable the conduit, select the *Do Nothing* option. The conduit does nothing in the *Desktop overwrites handheld* mode because data can only be transferred one way—from the handheld organizer to the PC.

Data

The conduit transfers three types of information from the handheld organizer to the PC—equipment, fault and trip. It creates and maintains three “globally accessible” files, one for each type of data. The files are named `equip.txt`, `faults.txt` and `trips.txt`. Each file is appended every time a HotSync process occurs, regardless of which user performs the process. This is different from what normally happens during HotSync synchronization; usually the system separates information by user.

In addition to appending new information onto the end of these files, backup versions are maintained, in case something catastrophic happens during a given HotSync process.

Upon a successful synchronization of QUICKCHECK data, the conduit instructs the handheld organizer to remove the downloaded fault and trip records from the handheld organizer, freeing memory for future downloads or other application

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Location

The location of the HotSync output files are as follows:

[palm root⁸]\quickchk\equip.txt

[palm root]\quickchk\faults.txt

[palm root]\quickchk\trips.txt

The backup copies of these files are stored in the same directory but have the extension .bak instead of .txt.

Formats

The conduit writes in spreadsheet-compatible, comma-separated value (CSV) file format. Each entry or record is a single line with multiple fields, separated by commas. This allows files to be easily imported into a program such as Microsoft Excel for further analysis. Users that want to manipulate the data further must use the exact format of each file that is detailed in the tables below.

EQUIPMENT FILE FORMAT

The equip.txt file has the following format:

1,834571,CMMNS*6CTA8.3 Li *45912984,03944105*03005053* *070402E5*E4*,RED-1460,Fri Feb 18 14:24:56 2000

Equipment File Format	
Field Name	Description
Equipment Identifier	Number —primary key of this table Other tables use this value.
VIN	String —vehicle information number
Component Parameter	String (variable length)—Make*Model*SerialNumber Note: <i>Make</i> is always five characters; the <i>Model</i> and <i>SerialNumber</i> are variable. The asterisks (*) are part of the string.
Software Identifier	String (variable length)— SoftwareID*AdditionalSoftwareIDField The asterisk (*) is part of the string.
Equipment ID	String —user-supplied Identification
Time of HotSync	String —date and time of HotSync operation

⁸ This is typically C:\palm

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FAULTS FILE FORMAT

The `faults.txt` file has the following format in which the data-type possibilities are numbers or textual strings:

1,Tuesday February 15 2000 15:19:27,9799.350000,362,6,251,128,4,1,Fuel Pump ECM, CAN Communication Error:Volt

Fault File Format	
Field Name	Description
Equipment Identifier	Number —index into equipment table
Download Time Stamp	String —date and time of download from equipment
Total Engine Hours	Number —in hours
Fault Code	Number —Cummins fault code if applicable
Flags	Number Bit Field —0x01 set if PID (vs. SID) 0x02 set if fault active 0x04 set if Cummins fault code is valid
Fault Identifier	Number —PID or SID depending on flag value
Message Identifier	Number —(sometimes referred to as MID)
Fault Mode Indicator	Number —(sometimes referred to as FMI)
Fault Count	Number —number of occurrences of fault
Fault Description	String —text string describing the fault
Time of HotSync	String —date and time of HotSync operation

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TRIPS FILE FORMAT

The trips.txt file has the following format:

1,Tuesday February 15 2000 15:19:27,503,799.35,1646.0,1148.8,8178.1,0,10.0,5.8,79.0,0, Tue Feb 15 16:16:03 2000

Trip File Format	
Field Name	Description
Equipment Identifier	Number —primary key of this table Other tables use this value.
Download Time Stamp	String —date and time of download from equipment
Valid Flag	Number —(bit field)
Total Engine Hours (0x01 ⁹)	Number —in hours
Total Idle Hours (0x02)	Number —in hours
Idle Fuel Used (0x04)	Number —in gallons
Total Vehicle Distance (0x08)	Number —in miles
Unused	Unused
Total PTO Hours (0x20)	Number —in hours
Total Fuel Used (0x40)	Number —in gallons
Max Road Speed Limit (0x80)	Number —in miles per hour
Cruise Control Set Speed (0x100)	Number —in miles per hour
Time of HotSync	String —date and time of HotSync operation

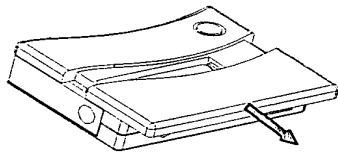
⁹ This is the value of the validation bit associated with a given parameter, which is located in the valid flag field of the record. If the mentioned bit is set (equal to one), the parameter is valid. If it is equal to zero, it is invalid or not available.

APPENDIX A: MAINTAINING YOUR QUICKCHECK HARDWARE

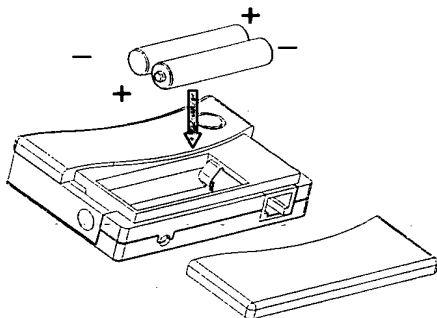
Battery Installation

The datalink adapter requires two AAA batteries for power—in addition to the batteries used to power the handheld organizer. A set of the adapter batteries should last up to 40 hours of continuous operation. When replacing the adapter batteries, always begin by removing the adapter from the handheld organizer.

Install two AAA batteries in your QuickCheck adapter



With the front of the QuickCheck adapter facing you, place your fingers on each side of the adapter. Using the small ridges to grip the battery door, slide the battery door toward you and away from the adapter.



Correctly install the batteries, paying close attention to the orientation of the batteries as shown in the diagram. A diagram in the interior of the battery compartment shows + and – ends of the batteries.

Replace the battery door. The battery door will click into position and be flush with the front of the adapter.

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Datalink Cable Storage

The datalink end of the cable (the 6 or 9 pin connector) should be disconnected from the vehicle datalink when the adapter is not in use.

Care

Treat the datalink adapter with care, just as you do the Palm Computing handheld organizer. Neither is waterproof and should not be exposed to rain or moisture.

Also like the handheld, the adapter should be protected from temperature extremes. Do not leave it on the vehicle dashboard on a hot day and keep it away from other heat sources including heaters.

APPENDIX B: FREQUENTLY ASKED QUESTIONS

Before requesting support, please experiment a bit to reproduce and isolate the problem. When you do contact support, please be ready to provide the following information:

The version of Windows operating system you are using on your PC

- The actual error message or state that you are experiencing
- The steps you take to reproduce the problem
- The version of organizer software you are using and available memory
- The version of QuickCheck software and Conduit you are using
- The version of HotSync Manager you are using on your PC

To find Windows operating system version information:

1. Click the Start menu in the Windows system tray on the bottom left side of your computer screen in the Taskbar.
2. Choose Settings then click Control Panel.
3. Double Click System

To find organizer version and memory information:

1. Tap the application icon on the handheld organizer.
2. Tap the Menu button located on the handheld organizer.
3. Tap App, and then tap info.
4. Tap Version to see version numbers, and tap Size to see the amount of free memory, in kilobytes.

To find QUICKCHECK version information:

1. Tap the QUICKCHECK application icon.
2. Tap the Menu button located on the handheld organizer.
3. Tap Options.
4. Tap About QUICKCHECK.

To find HotSync Manager version information:

1. Click the HotSync Manager icon in the Windows system tray on the bottom right side of your computer screen in the Taskbar.
2. Click About.

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Installation Problems

I'm having problems installing my Desktop organizer software.

- Review the Palm Handbook including its Frequently Asked Questions. Use Palm Technical Support if needed.

I tried to install the QuickCheck software on my computer and it would not install.

- Verify that your computer operating system is Windows 95/98/NT and is IBM-compatible 486 computer or later. The QuickCheck software is not Mac compatible.
- HotSync Manager and the Palm Desktop software must be installed on your computer before QuickCheck software can be installed. If they are not installed on your computer then insert the Palm Desktop CD-ROM into your computer and wait for the Installer Menu Screen. Click INSTALL and follow the instructions onscreen.

I am using Desktop organizer software other than the Palm Desktop software and my QuickCheck software and Conduit would not install.

- Activate the Palm Desktop software, install the QuickCheck software then activate the Desktop software that you use. The latest version of the Palm Desktop software can be downloaded without cost at the Palm website: <http://www.palm.com>

I tried to install a new version of QuickCheck software and it would not install on my organizer.

- Delete the old version of software from the Palm organizer then install the new version of software.

Operating Problems

My adapter won't turn on.

Try each of these in turn:

- Take the adapter off the organizer and install again.
- Make sure the batteries are installed properly.
- Replace the batteries.
- Take the cable off and install again. Verify that the vehicle key is in the on position and the ECM is getting power.

I cannot read engine data.

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Application Problems

- | | |
|--|--|
| I tried to save engine data and it would not save. | <ul style="list-style-type: none">• Make sure an Equip ID is entered.• Verify that a make, model or serial number has been received. Data from equipment can not be saved without an Electronic Data Plate that includes the make, model, or serial number. |
| I went into Stop mode to review my saved data and the application is slow. | <ul style="list-style-type: none">• The more records of saved data that are on the organizer, the longer it will take to view the saved data. Removing records from the organizer by a Hotsync or by deleting unwanted records or equipment will speed up the application. |
| The QuickCheck application is slow | <ul style="list-style-type: none">• When there are more than five faults in the fault list the application can become slow. |
| Data from deleted equipment is showing up in other equipment data. | <ul style="list-style-type: none">• Always HotSync all data to the PC before a delete equipment operation is performed. |
| I can not see the complete VIN number. | <ul style="list-style-type: none">• The application has a set number of characters that can be viewed. The complete VIN number can be seen in the equip.txt text files on your PC after a Hotsync. |

HotSync Problems

I tried to do a local HotSync operation but it did not complete successfully.

- Verify that the HotSync Manager is running. If it is not, open Palm Desktop software. If the HotSync Manager is running, exit and restart it.
- Click the HotSync Manager, choose Setup and click the Local tab. Check that the Serial Port setting displays the correct COM port where your cradle is attached. Your organizer can not share this port with an internal modem or other devices such as INSITE.
- Make sure the cradle is connected securely.
- Review the Palm Handbook including its Frequently Asked Questions. Use Palm Technical Support if needed.

I did a HotSync operation, but the QuickCheck application did not synchronize.

- Verify that the HotSync Manager is running. If the HotSync Manager is running, exit and restart it.
- Click the HotSync Manager and choose Custom. Check that the Cummins QuickCheck conduit is set to Synchronize the files.
- The Palm Desktop software must be installed and activated on your computer to HotSync the QuickCheck software.

I did a HotSync operation, but my QuickCheck data did not get uploaded to my computer.

- Verify that the HotSync Manager is version 3.0 or later and is running. Update it to the latest version without cost at the Palm website: <http://www.palm.com>
- Click the HotSync Manager and choose Custom. Check that the Cummins QuickCheck conduit is set to Synchronize the files.
- There are no databases until equipment data is saved on the organizer. Once data is saved the databases are created and this error will go away. Ignore this error.

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Beaming Problems

I cannot beam the QuickCheck application to another organizer. • The QuickCheck application is copy-protected and cannot be beamed.

If you encounter a problem with your QUICKCHECK device, please call our software Technical Support Center only after you have reviewed the previous list of Frequently Asked Questions and the Palm Handbook, including its list of Frequently Asked Questions. If you find it necessary to contact our software Technical Support Center, use the following telephone numbers:

Telephone: 1-800-433-9341 or 1-812-377-8136

Fax: 1-800-232-6393 or 1-812-377-4200

Note: Unfortunately, we are not able to provide support for Palm Computing platform issues. If you are having a problem with the Palm organizer, please review the Palm Handbook then contact Palm Technical Support if necessary. The Handbook also includes a list of Frequently Asked Questions that should be reviewed.

APPENDIX C: FAULT CODES

This Appendix provides interpretations for the engine fault codes you may receive from your engine. PID refers to the Parameter Identifier, SID to the Subsystem Identifier, and FMI to the Failure Mode Identifiers. Each PID, SID, and FMI is identified by a number. You may notice some numbers missing from the following tables, as **not** all numbers have been defined.

Parameter Identifier (PID)

PID	Description
72	Blower Bypass Valve Position
73	Auxiliary Water Pump Pressure
74	Maximum Road Speed Limit
75	Steering Axle Temperature
76	Axle Lift Air Pressure
77	Forward Rear-Drive Axle Temperature
78	Rear Rear-Drive Axle Temperature
79	Road Surface Temperature
80	Washer Fluid Level
81	Particulate Trap Inlet Pressure
82	Air Start Pressure
83	Road Speed Limit Status
84	Road Speed
85	Cruise Control Status
86	Cruise Control Set Speed
87	Cruise Control High-Set Limit Speed
88	Cruise Control Low-Set Limit Speed
89	PTO Status
90	PTO Oil Temperature
91	Percent Accelerator Pedal Position
92	Percent Engine Load
93	Output Torque
94	Fuel Delivery Pressure
95	Fuel Filter Differential Pressure
96	Fuel Level
98	Engine Oil Level
99	Engine Oil Differential Pressure
100	Engine Oil Pressure
101	Crankcase Pressure
102	Boost Pressure
103	Turbocharger Speed
104	Turbocharger Oil Pressure
105	Intake Manifold Temperature

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106	Air Inlet Pressure
107	Air Filter Differential Pressure
108	Barometric Pressure
109	Coolant Pressure
110	Engine Coolant Temperature
111	Coolant Level
112	Coolant Filter Differential
113	Governor Drop
114	Net Battery Amps
115	Alternator Amps
116	Brake Application Pressure
117	Brake Primary Pressure
118	Brake Secondary Pressure
119	Hydraulic Retarder Pressure
120	Hydraulic Retarder Oil Temperature
121	Engine Retarder Status
122	Engine Retarder Percent
123	Clutch Pressure
124	Transmission Oil Level
125	Transmission Oil Level High/Low
126	Trans Filter Differential Pressure
127	Transmission Oil Pressure
128	Component-specific Parameter request
165	Compass Bearing
166	Rated Horsepower
167	Volts (Alternator)
168	Volts (Battery)
169	Cargo Ambient Temperature
170	Cab Interior Pressure
171	Ambient Air Temperature
172	Air Inlet Temperature
173	Exhaust Gas Temperature
174	Fuel Temperature
175	Engine Oil Temperature
176	Turbocharger Oil Temperature
177	Transmission Oil Temperature
178	Front Axle Weight
179	Rear Axle Weight
180	Trailer Weight
181	Cargo Weight
182	Trip Fuel
183	Fuel Rate
184	Instantaneous Miles Per Gallon
185	Average Miles Per Gallon
186	Power Takeoff Speed
187	Power Takeoff Set Speed

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188	Idle Engine Speed
189	Rated Engine Speed
190	Engine Speed
191	Transmission Output Shaft Speed
192	Multisection Parameter
193	Old Fault Code Format
194	Transmitter System Diagnostic Code and Occurrence Count Table
195	Diagnostic Data Request/Clear Count
196	Diagnostic Data/Count Clear Response
229	Total Fuel Used (Natural Gas)
230	Total Idle Fuel Used (Natural Gas)
231	Trip Fuel (Natural Gas)
232	DGPS Differential Correction
233	Unit Number (Power Unit)
234	Software Identification
235	Total Idle Hours
236	Total Idle Fuel Used
237	Vehicle Identification Number
238	Velocity Vector
239	Vehicle Position
240	Change Reference Number
241	Tire Pressure
242	Tire Temperature
243	Component Identification
244	Trip Miles
245	Total Miles
246	Total Vehicle Hours
247	Total Engine Hours
248	Total PTO Hours
249	Total Engine Revolutions
250	Total Fuel Used
251	Clock
252	Date
253	Elapsed Time

Engine Subsystem Identifier (SID)

SID	Description
0	Reserved for later use
1	Injector Cylinder #1
2	Injector Cylinder #2
3	Injector Cylinder #3
4	Injector Cylinder #4
5	Injector Cylinder #5
6	Injector Cylinder #6
7	Injector Cylinder #7
8	Injector Cylinder #8
9	Injector Cylinder #9
10	Injector Cylinder #10
11	Injector Cylinder #11
12	Injector Cylinder #12
13	Injector Cylinder #13
14	Injector Cylinder #14
15	Injector Cylinder #15
16	Injector Cylinder #16
17	Fuel Shutoff Valve
18	Fuel Control Valve
19	Throttle Bypass Valve
20	Timing Actuator
21	Engine Position Sensor
22	Timing Sensor
23	Rack Actuator
24	Rack Position Sensor
25	External Engine Protection Input
26	Auxiliary Output Device Driver
27	Variable Geometry Turbo Charger Actuator #1
28	Variable Geometry Turbo Charger Actuator #2
29	External Fuel Command Input
30	External Speed Command Input
31	Tachometer Signal Output
32	Wastegate Output Device Driver
33	Fan Clutch Output Device Driver

Failure Mode Identifier (FMI)

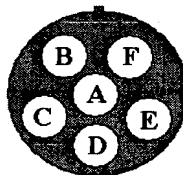
FMI	Description
0	Data valid but above normal operational range
1	Data valid but below normal operational range
2	Data erratic, intermittent or incorrect
3	Voltage above normal or shorted high
4	Voltage below normal or shorted low
5	Current below normal or open circuit
6	Current above normal or grounded circuit
7	Mechanical system not responding properly
8	Abnormal frequency, pulse width or period
9	Abnormal update rate
10	Abnormal rate of change
11	Failure mode not identifiable
12	Bad intelligent device or component
13	Out of calibration
14	Special instructions
15	Reserved for future use

APPENDIX D: CONNECTOR PIN-OUTS

DEUTCH HD16 - 6 - 12S

6 position connector

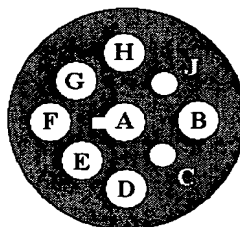
- A - J1587 + (Orange)
- B - J1587 - (White)
- C - NC
- D - NC
- E - GROUND (Blue)
- F - NC



DEUTCH HD17 - 9 - 1939SE

9 position connector

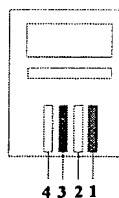
- A - GROUND (Blue)
- B - NC
- C - NC
- D - NC
- E - NC
- F - J1587 + (Orange)
- G - J1587 - (White)
- H - NC
- J - NC



Amp 5-641335-3

4 Pin RJ11 Phone Plug

- 1 - J1587 + (Orange/White)
- 2 - NC (White/Blue)
- 3 - Ground (Blue/White)
- 4 - J1587 - (White/Orange)



Cable 3163863

DEUTCH HD16 – 6 - 12S 6 position connector FROM PIN	Amp 5-641335-3 4 Pin RJ11 Phone Plug TO PIN	FUNCTION
A	1	J1587 +
E	3	GROUND
B	4	J1587 -

Cable 3163864

DEUTCH HD17 - 9 - 1939SE 9 position connector FROM PIN	Amp 5-641335-3 4 Pin RJ11 Phone Plug TO PIN	FUNCTION
F	1	J1587 +
A	3	GROUND
G	4	J1587 -

GLOSSARY

Auto	data will be automatically saved about 15 seconds after the make, model, or serial number is read.
Disconnected	data is not being read from the datalink
Eng. Hrs	engine hours
Equip ID	field containing the name of each piece of equipment entered into the handheld organizer
FMI	Failure Mode Identifier
handheld organizer handheld device handheld organizer	Palm Computing devices for QUICKCHECK datalink reader: PalmPilot Professional Edition™ Palm III™ Palm IIIe™ Palm IIIx™ Palm V™ with a special adapter Palm VII™
HotSync Manager®	Palm Computing synchronization technology control software
HotSync® process	Palm Computing synchronization technology
IMT	intake manifold temperature
INLINE™	Cummins Engine Company, Inc datalink adapter
INSITE™	Cummins Engine Company, Inc. service tool
Out. Torq.	output torque
PID	Parameter Identifier
QUICKCHECK™	Cummins Engine Company, Inc. datalink reader
Serial No.	engine serial number
SID	Subsystem Identifier
Soft ID	software identification—field on the Equipment screen
Stop	1. use to disconnect datalink 2. use to review stored data
Unavailable	data for the parameter is not available to read
VIN	vehicle identification number

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